

ON THE RADICAL CURE OF OBLIQUE INGUINAL
HERNIA BY INTERNAL ABDOMINAL PERI-
TONEAL PAD, AND THE RESTORA-
TION OF THE VALVED FORM
OF THE INGUINAL
CANAL.

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IN the many operations for radical cure of hernia, as at present performed, the sac is either retained in the canal (being dealt with in various ways), or a ligature is placed on its neck and the remainder of the sac is cut off. Wood's operation is the type of the former, while that which Mr. Banks has described may be taken as illustrative of the latter. The treatment of the sac in the operation about to be described, differs from these, inasmuch as, while the sac is preserved, it is completely returned beyond the limits of the canal and formed into a pad which is placed on the abdominal aspect of the circumference of the internal ring.

When the sac is left in the canal it acts as a plug. Plugs tend to widen instead of obliterating the canal and prevent the pillars from coming in direct apposition. Organic union is difficult to secure between portions of tissue which have not had their surfaces refreshed, such as the canal with its intervening sac. To overcome this the wires in Wood's operation are twisted firmly down so as to excite plastic effusion which it is hoped will suffice to mat the tissues together. This is undoubtedly secured in many instances, while in others it is not attained. Both when the sac is dealt with in this manner and when its neck is ligatured, there remains a funnel-shaped puck-

ering of the peritoneum, the apex of which presents in or at the internal ring. When the liquid movement of the intestine as it glides over the peritoneum is thrown into the form of a wave by the sudden impulse of straining or coughing, it is carried into this pouch which guides it into the canal where it expends its force. It thus acts as a wedge widening and tending to open up the canal.

With the view of obviating these defects, the sac in the operation about to be described, is carefully separated, not only from the entire inguinal canal, but also from the abdominal aspects of the circumference of the internal ring. It is completely reduced from the canal into the abdomen beyond the internal ring, then thrown into a series of folds, constituting a pad which is placed on the peritoneal surface opposite the internal ring. It there constitutes a boss or bulwark with its convexity presenting backwards toward the abdomen, while its base rests on the abdominal walls surrounding the circumference of the internal ring. This not only protects the internal ring, but sheds the intestinal wave backwards away from the opening.

Having thus secured the peritoneal surface, some surgeons would be inclined to leave the canal alone, thinking when the former is accomplished that the bulwark behind requires little strengthening. While agreeing in the primary importance of securing the peritoneal surface, it is considered advisable to bring into apposition and to unite parts which are abnormally wide, greater security and resisting power being thus imparted to the abdominal wall. This is especially the case, as the valve like formation of the canal is more or less obliterated in hernia, the internal ring being widened by the pushing inwards of the conjoint tendon, so that the external and the internal apertures are placed more directly opposite each other.

The canal having been refreshed by the finger and the handle of the scalpel during removal of the sac therefrom, its walls are brought into direct contact. This may be effected by any of the many methods of stitching. There are, however, in most of these methods, two objectionable points which ought to be obviated. First, the stitch through the conjoint tendon is single and includes the external oblique, therefore the apposition

of the internal with the outer pillar is not so extensive or so exact as it would be were a double suture placed in the conjoint tendon alone. Second, the conjoint tendon is approximated to the outer pillar of the external ring, the abdominal walls being thinned thereby and the natural valve which the canal forms is to a great extent obliterated. Instead, one ought to endeavor to bring the conjoint tendon into close proximity with the outer wall represented below by that portion of Poupart's ligament on a level with the lowest part of the internal opening, and above by Poupart's ligament, the transversalis and internal oblique muscles at a point corresponding to the highest level of the internal ring, the aim being to carry the conjoint tendon outwards toward the fixed unyielding ligament of Poupart and to unite it with the transversalis and internal oblique muscles. In oblique inguinal hernia, the transversalis muscle ought never to be included in the suture, as that would tend to defeat the desired object.

The principles of this operation may be equally applied to other forms of abdominal hernia, though in this paper its application to indirect inguinal hernia is alone described.

Preparation of the Parts Prior to Operation.—Before operating the hair of the pubes and neighboring parts is closely shaven, the skin is washed with soap and water, a nail brush being employed for this purpose. After drying, turpentine is smeared over the parts to remove any grease which may remain, a little methylated spirit clearing away the turpentine and leaving the skin in a good condition for operating. The parts are then covered with a portion of lint saturated with a bichloride solution until the patient is placed under the influence of an anæsthetic.

When the patient has been anæsthetized, the limb on the side of the hernia is flexed at the knee by a pillow which is placed under the latter. An assistant stands at the opposite side of the surgeon whose duty it is to retract the parts.

Hernia Needles.—The needles found to be most useful for the insertion of the stitch into the inguinal canal are figured here, one being used for passing the thread from right to left, the other from left to right. They are serviceable for many other purposes, such as for inserting sutures through broad

ovarian pedicles or through masses of omentum which are about to be removed. Wood's needle might, however be employed for all the sutures, except the double one introduced into the conjoint tendon.

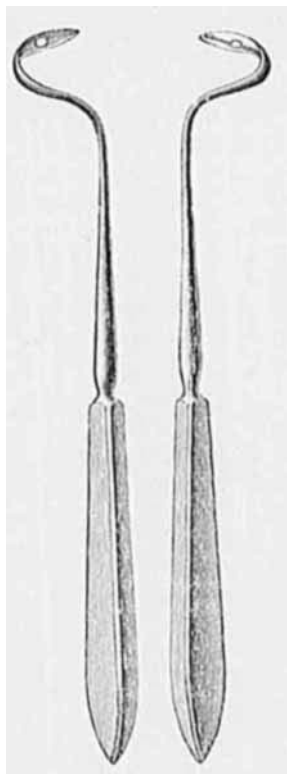


FIG. 1. NEEDLES, RIGHT AND LEFT, USED IN OPERATION FOR RADICAL CURE OF HERNIA.

The handle and blade are continuous being made from one piece of steel.

Operation for Radical Cure of Inguinal Hernia.—After having reduced the bowel make an incision sufficient to expose the external abdominal ring. An exploration of the sac

and its contents is then made and the finger introduced through the canal examines the abdominal aspects of the internal ring and the relative position of the epigastric artery. The operation may then be divided into two parts, the one relating to the establishment of a pad on the abdominal aspects of the internal ring, the other, to the closure of the inguinal canal. The steps of the operation are as follows:

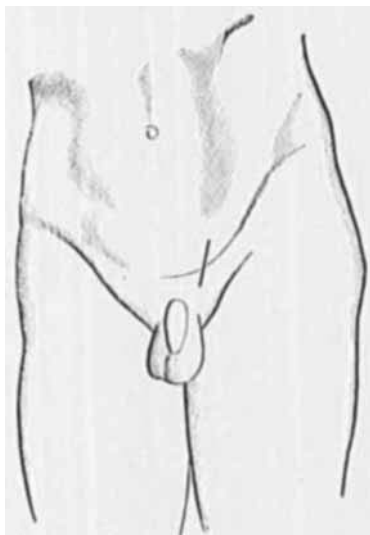


FIG. 2. SITE OF INCISION.

The dark line shows site of incision, exposing external opening of inguinal canal.

(A). The formation of a pad on the abdominal surface of the *circumference of the internal ring*.

(1). Free and elevate the distal extremity of the sac, preserving along with it any adipose tissue that may be adherent to it. When this is done, pull down the sac, and while maintaining tension upon it, introduce the index finger into the inguinal canal separating the sac from the cord and from the parietes of the canal.

(2). Insert the index finger outside the sac till it reaches the internal ring, there separate with its tip, the peritoneum for about half an inch round the whole abdominal aspects of the circumference of the ring. (Fig. 3).



FIG. 3. SEPARATING THE PERITONEUM.

Showing finger inserted through inguinal canal, separating the peritoneum from abdominal aspects of circumference of internal ring.

(3). A stitch is secured firmly to the distal extremity of the sac. The end of the thread is then passed in a proximal direction several times through the sac, so that when pulled upon the sac, becomes folded upon itself like a curtain. (Fig. 4). The free end of this stitch, threaded on a hernial needle, is made to traverse the canal and to penetrate the anterior abdominal wall about an inch above the internal ring, the wound in the skin being pulled upward so as to allow the point of the needle

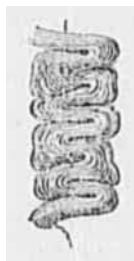


FIG. 4. FOLDING THE SAC.

The sac transixed and drawn into a series of folds.

to project through the abdominal muscles without penetrating the skin. (Fig. 5.) The thread is relieved from the extremity of

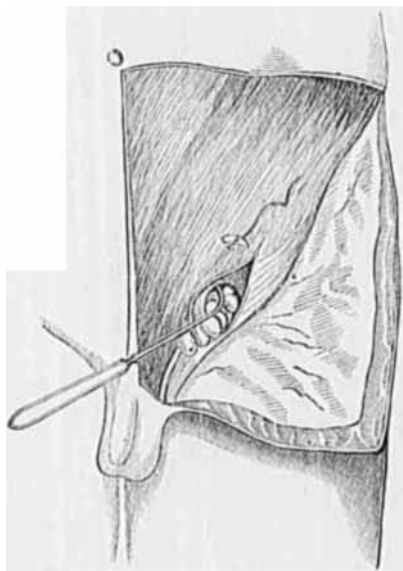


FIG. 5. SECURING THE FOLDED SAC ABOVE.

The hernia needle carrying the thread from the upper portion of the sac through the abdominal muscles from behind forward about an inch above the internal ring.

the needle, when the latter is withdrawn. The thread is pulled through the abdominal wall and when traction is made upon it, the sac wrinkling upon itself is thrown into a series of folds, its distal extremity being drawn furthest backwards and upwards. An assistant maintains traction upon the stitch until the introduction of the sutures into the inguinal canal, and when this is completed the end of the stitch is secured by introducing its free extremity several times through the superficial layers of the external oblique muscle; or it may be secured to a minute portion of decalcified drainage tube placed on the surface of the muscle. A pad of peritoncum is thus placed upon the abdominal side of the internal opening, where, owing to the abdominal aspect of the circumference of the internal ring having been refreshed, new adhesions may form. (Fig. 6).



FIG. 6. PAD COVERING ABDOMINAL ASPECT OF INTERNAL RING.

The following modifications have been practised: After securing the stitch to the distal extremity of the sac, the thread has been passed directly through the abdominal muscles without first transfixing the sac. In children this may be sufficient. On one occasion, instead of placing the stitch extra-peritoneally it was introduced from within, the sac being completely invaginated so as to resemble an umbilicus, the prominence being directed backward into the abdomen. The case did well in every respect. This method has not been repeated as the extra peritoneal method answers equally well. After having reduced the sac into the abdominal cavity and securing it there, it has been fixed below by a stitch as well as above. This has been found to be unnecessary.

(B). *Closure of the Inguinal Canal.*—The sac having been returned into the abdomen and secured to the abdominal circumference of the ring this aperture is closed outside of it in the following manner: The finger is introduced into the canal and lies between the inner and lower borders of the internal ring. It makes out the position of the epigastric artery so as

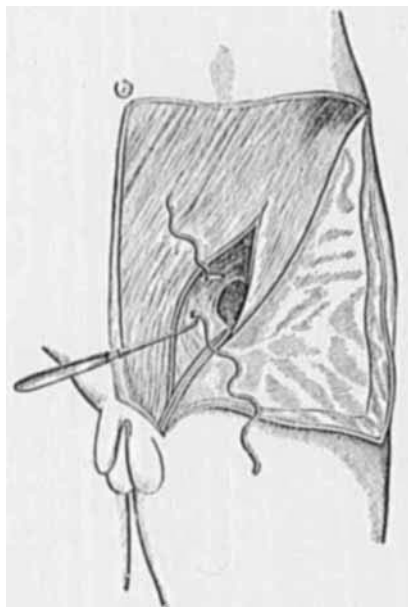


FIG. 7. THE THREADED HERNIA NEEDLE MAKING DOUBLE PENETRATION OF CONJOINT TENDON.

to avoid it. The threaded hernia needle is then introduced and guided by the index finger is made to penetrate the conjoint tendon in two places. First from without inwards near the lower border of the conjoint tendon; second, from within outwards as high as possible on the inner aspects of the canal. This double penetration of the conjoint tendon is accomplished by a single screw like turn of the instrument. (Fig. 7.) One

single thread is then withdrawn from the point of the needle by the index finger, and when this is accomplished, the needle along with the other extremity of the thread is removed. The inner side of the conjoint tendon is therefore penetrated twice by this thread and a loop left on its abdominal aspect (Fig. 8).

Second. The other hernia needle, threaded with that portion of the stitch which comes from the lower border of the con-

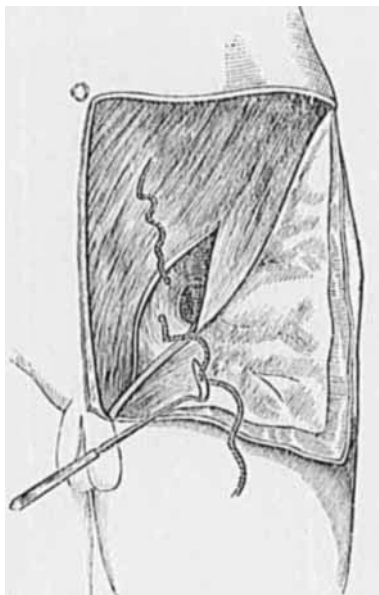


FIG. 8. LOOP ON ABDOMINAL ASPECT OF CONJOINT TENDON.

joint tendon, guided by the index finger in the inguinal canal, is introduced from within outwards through Poupart's ligament and the aponeurotic structures of the transversalis, internal and external oblique muscles. It penetrates these structures, at a point on a level with the lower stitch in the conjoint tendon (Fig. 9). The needle is then completely freed from the thread and withdrawn.

The needle is now threaded with the gut which protrudes from the upper border of the conjoint tendon and is introduced from within outwards through the transversalis, internal and external oblique muscles at a level corresponding with that of the upper stitch in the conjoint tendon. It is then quite freed

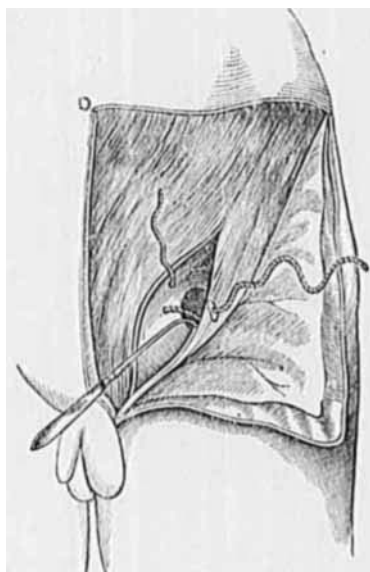


FIG. 9. THREAD FROM LOWER BORDER OF CONJOINT TENDON BEING CARRIED THROUGH OUTER PILLAR OF INTERNAL RING.

from the thread and withdrawn (Fig. 10). There are now two free ends of the suture on the outer surface of the external oblique and these are connected with the loop on the abdominal aspect of the conjoint tendon. To complete the suture the two free ends are drawn tightly together and tied in a reef knot.

This unites firmly the internal ring. The same stitch may be repeated lower down the canal if thought desirable. In adults it is well to do so. The pillars of the external ring are

likewise brought together. In order to avoid compression of the cord, it ought to be examined before tightening each stitch. It ought to be freely movable. It is advisable to introduce all the necessary sutures before tightening any of them. When this is done, they may be all drawn tight and maintained so while the operator's finger is introduced into the canal to ascertain the result. If satisfactory, they are then tied, beginning

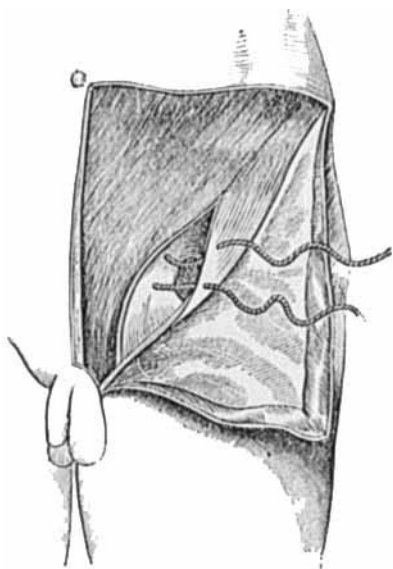


FIG. 10. THREAD READY FOR TYING.

In Figures 3, 5, 7, 8, 9 and 10 the skin and cellular tissue is reflected in a flap and the external oblique is opened up in such a way as to expose the interior of the canal and the internal ring.

with the one at the internal ring and taking up the others in order. During the operation, the skin is retracted from side to side, to bring the parts into view and to enable the stitches to be fixed subcutaneously. When the retraction is relieved the skin falls into its normal position, the wound being opposite

the external ring. The operation is therefore partly subcutaneous.

When the canal has been brought together, a decalcified chicken bone drainage tube is placed with its one extremity next the external ring, the other projecting just beyond the lower border of the external wound. A few chromic gut sutures are then introduced along the line of skin incision.

Dressing the Wound.—Iodoform is dusted over the wound, the interstices of the scrotum and its junction with the thigh. A small portion of sublimated gauze is applied and on top a sublimated wood-wool pad held in position by an aseptic bandage. As a rule a portion of elastic webbing is placed over the margins of the pad to secure it firmly.

As the patient is laid in bed, a pillow is placed under his knees while his shoulders are slightly raised, so as to relax the tissues about the canal.

After Treatment.—The rectal temperature is taken night and morning, and at the same time the dressings are inspected. The dressings are left undisturbed from fourteen to twenty-one days, unless they are previously stained or the temperature is abnormally high. On their removal at the end of that period the wound is found healed, the extremity of the decalcified drainage tube which projected beyond the margin of the skin is seen to lie loose on the dressings along with the external portion of the majority of the superficial stitches. A fresh pad is applied to maintain pressure over the part. From four to six weeks after the operation, the patient is allowed to rise from bed, but he is not permitted to work until the end of the eighth week. He is further advised not to lift heavy weights until the end of the third month at the very earliest. Adults engaged in laborious occupations are advised to wear a bandage and pad, as a precautionary measure. Those who are not so engaged are not required to wear a belt except when of very lax habit. All are recommended not to overstrain themselves. In the majority of children (six to fourteen years) the closure is so complete and firm that further treatment by pad or belt is quite unnecessary.

Operation for Radical Cure of Congenital Hernia.—In congenital hernia the sac is first isolated from its connection with

the canal. It is then opened and divided transversely into two parts, care being taken to preserve the cord. The lower part is formed into a tunica vaginalis. The upper is pulled down as far as possible, split behind longitudinally so as to allow the cord to escape, when it is closed by a stitch or two (Fig. 11). This portion is then dealt with quite as the sac of an acquired hernia, additional precautions being necessary to clear the cord at the internal abdominal ring. It is freed of its connections and placed as a pad on the abdominal aspect of the circumference of the internal ring.

On one occasion a separate tube was formed for the cord out of the sac but this has not been repeated.

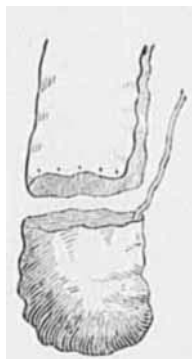


FIG. 11. MANNER OF TREATING THE SAC IN CONGENITAL INGUINAL HERNIA.

Materials for Suture.—Any of the materials usually employed as sutures may be used in this operation, provided the thread is sufficiently stout to prevent it rapidly ulcerating its way through the tissues. All are not equally serviceable, however. The substances hitherto used may be divided into three groups; first, those introduced with the object of being withdrawn after they have served their temporary purpose; second, those inserted with the view of permanently maintaining in apposition the parts which they have brought together, while they do not set up irritation in the tissues; and third, those that are intro-

duced to serve their purpose and which are afterwards absorbed. The first may be represented by the stout copper wire silvered used by Mr. Wood, of King's, which admirably answers the purpose to which he applies it. As it has to be removed after a definite period, the suture must be so placed that a portion of it presents externally. Though in the operation brought forward in this paper it is possible to arrange the sutures so as to permit of their ultimate withdrawal, yet in describing the manner of securing them it will be seen that this is purposely avoided, all of them being fixed subcutaneously. The second method is that of inserting a metallic suture, which, after being secured is cut off short, the tissues being closed over it. Some employ this method, merely to obviate the necessity of removing the wire, believing that it remains in the tissues and does not work its way out; while others consider that it not only has these advantages, but it also maintains by its presence the permanent apposition of the parts. That wire sutures when properly applied, without leaving any sharp points projecting from the circle into which they are formed, *may* remain indefinitely in the tissues without producing irritation or working their way out, is an established fact. This is especially the case where they are inserted into bone with their extremities turned in. It is not, however, a constant occurrence even in bone, less so in soft tissues, and much less still in tissues habitually subjected to movement. This is consistent with my own observation, and it is admitted by many of those who practice and most strongly advocate the leaving of the sutures of metal in situ. Granting that the wire suture remains permanently in the tissues without producing irritation, does the mere fact of it doing so serve any purpose? Some believe that its function is ended when it has brought the pillars of the ring closely together and has maintained them there for some fourteen or twenty-one days; after which it might as well be outside. Others, however, are of opinion that it maintains the pillars of the ring permanently in apposition. This is not the case. It serves a purpose in this respect while it exerts traction on the pillars. As long as it maintains tension on the tissues, the wire being itself unyielding, it causes ulceration of the parts pressed on. This ulcerative process will continue until the wire in relation

to the tissues has reached a position of rest. When this is accomplished it is no longer an active agent but descends to the condition of a foreign body which at best becomes encapsuled in the tissues but occasionally gives rise to disturbance which ends in its elimination. The third variety embraces substances which serve their purpose and which are afterwards absorbed. By far the most serviceable of such substances is cat-gut prepared so as to resist the action of the tissues from fourteen to twenty-one days. Gut of this description has been used for securing the pad of peritoneum and also for the closure of the canal. Gut prepared for a shorter period and which will only resist the action of the tissues for a week is used for the tissues in the superficial wound. The use of these stitches along with decalcified chicken bone drainage tubes obviates the necessity of subsequent interference with the wound. The latter admirably serve the purpose for which they were intended, securing drainage during the first six days and then becoming entirely absorbed.

Results.—There have been thirty-three cases in which the operation has been performed for radical cure of inguinal hernia, and fourteen have been subjected to it subsequently to the relief of strangulation; making in all forty-seven cases of inguinal hernia in which this method has been performed. In nine others, the principles of it were carried out in femoral hernia, after the relief of strangulation. In both of the latter classes of cases the operation was not performed where gangrene of the bowel was pronounced, or even where there was a distinct approach to this condition. In a number of femoral hernie it could not be performed owing to the firm adhesions of the sac, especially when they were to the outer side next the femoral vein.

A tabulated view of these cases is here appended, from which it will be seen that there have been no deaths from the operation. In a few cases suppuration has ensued and that to a very slight extent, with the exception of a femoral hernia in which there was a prolonged dissection necessary. All the patients before leaving the ward were thoroughly inspected, and firm occlusion was obtained in each; so that the primary result was highly satisfactory. But it is just in cases of this kind

that the permanent result so often differs from the primary, and as the former is the true test of the efficiency of the operation, the patients have been kept under observation as long as possible. In judging of the permanent results two must be excluded from table No. 1, as having been so recently operated on. The remainder in table No. 1 have been kept under observation as follows: Four from four to six months after, four from eight to ten months, two for one year after, three for about one year and a half, five for two years, five for three years, one for four years and one for five years. So that eight have been kept under observation for less than a year, and seventeen from one to five years. Table No. 2 gives: one for eight months, three for one year after, three eighteen months after, four two years after, two three years after, and one four years after. Table No. 3 gives: One not seen after dismissal, two seen eight months after, two one year after, one eighteen months after, one two and a half years after, two three years after. In table No. 2 one has been kept under observation for less than a year, and thirteen from one to four years after. In table No. 3 two have been kept under observation for less than one year, and six from one to three years after; while one was not seen after dismissal from the wards. In all of them when last examined the rings remained firm. Out of the thirty-three cases in which this operation has been performed for radical cure one only has been found subsequently to wear a pad and bandage. In this instance patient said that he had been wearing a truss so long previously to the operation that he felt "a want" when there was no bandage over the part. It was more a force of habit than a need. The parts were firm. Among the fourteen who had been subjected to radical cure after the relief of strangulated inguinal hernia, three subsequently wore a pad and bandage as a precautionary measure. One of these was of very lax habit and was advised to continue the use of a support; one was a case of direct inguinal hernia with a very wide opening in the abdominal muscles; while the third did so as his occupation (engineer) often demanded considerable exertion. After the femoral hernias no truss has been worn.

TABLE NO. I.

CASES OF INGUINAL HERNIA SUBMITTED TO RADICAL CURE BY SPECIAL OPERATION.

| NATURE OF HERNIA. | | | | | | | | | | Highest Rect. Temp. | Suppura- tion. Dressings. | Result. | Remarks. |
|-------------------|------------|-------|------------------|------------------|---------------------|------------------------|-----------------------------------------------|------------|-----------------------------|---------------------|---------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date. | Name. | Age. | Occupa- tion. | Duration. | Contents of Sac. | Direct or Indirect. | Congen- ital, In- fantile, Acquired. | Operation. | | | | | |
| 1 | Mar. '79. | J. C. | 35 | Hammer- man. | (?) years. | Intes- tinal. | Indirect. | Acquired. | Rad. cure. | 100.8° F. | One. | Occlusion perfect. | Wound examined 21 days after and found firm. Seen three years after, firm occlusion. No truss. |
| 2 | Sept. '79. | A. S. | 28 | Millwork- er. | Several years. | Intes- tinal. | Indirect. | Acquired. | Rad. cure. | 99° F. | One. | Per fect. Firm occlu- sion. | Wound examined twenty-one days af- ter and found firm. Patient kept under observation for five years, at end of which time parts were firmly united. No support worn. |
| 3 | July '80. | J. C. | 5 | Nil. | 3 years. | Intes- tinal. | Indirect. | Acquired. | Rad. cure. | 99.8° F. | One. | Firm occlusion. | Wounds examined fourteen days after. Both firm. Patient kept under observa- tion for three years. Kings found to be very firm. Wear no support. |
| 4 | July '80. | J. C. | 5 | " | " | " | " | " | " L. side. " R. side. | " | Three. | " | |

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|----|-----------|-------|----|------------------|----------|----------------------------------------|-----------|------------------|--------------------------------------------------------------------------|------------------------------|-------|------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 | Dec. '80. | G. P. | 44 | Traveller. | 6 years. | Intes- tinal. | Indirect. | Acquired. | Rad. cure. | R. 100.8° F. L. 101.4° F. | None. | One. | Firm occlusion. | Wounds examined fourteen days after operation found healed. Seen eight months after, ring perfectly firm. Afterwards went abroad. |
| 6 | Dec. '80. | G. P. | 44 | " | " | " | " | " | " | " | " | " | " | " |
| 7 | Feb. '81. | M. W. | 15 | Black- smith. | 5 years. | Intes- tinal. | Indirect. | Acquired. | Rad. cure. | R. 100.6° F. L. 100.2° F. | None. | Two. | Ring firm. | Ten days after opera- tion wounds were both found healed. Three months after, wards both rings were found firmly occluded. Two years subsequently reported doing well. Rings firm. No truss used. |
| 8 | Feb. '81. | M. W. | 14 | " | " | " | " | " | " | " | " | " | " | " |
| 9 | Mar. '81. | A. B. | 5 | Nil. | 5 years. | Intes- tinal. | Indirect. | Con- genital. | Rad. cure. Sac- culi and dis- cussed as de- scribed in text. | 100° F. | None. | One. | Ring firm. | Fourteen days after wound superficial. Slight line of granu- lation tissue which healed by 21st day. Seen 9 months after. Occlusion perfect. No bells. |
| 10 | May '81. | R. H. | 28 | Med. student. | 5 years. | Intestinal and right omental. | Indirect. | Acquired. | Rad. cure. | 99.4° F. | None. | One. | Occlusion perfect. | At end of fourteen days dressing re- moved for first time. Wound firm. Ex- tremity of decalcified chicken bone and drainage tube and chromic gut stitches lying loose in dress- ing. Two years at |

CASES OF INGUINAL HERNIA SUBMITTED TO RADICAL CURE BY SPECIAL OPERATION. *Continued.*

| No. | Date. | Name. | Age. | Occupation. | NATURE OF HERNIA. | | | Operation. | Highest Rect. Temp. | Support. N. of dressings. | Result. | Remarks. |
|-----|-----------|-------|------|-------------|-------------------|-------------------------|--------------------------------|------------------------|-----------------------------|---------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | | Duration. | Contents of Sac. | Contents Directed or Indirect. | Contents of Intestine. | | | | |
| 11 | May '81. | W. D. | 56 | Porter. | 10 years. | Intestinal and omental. | Indirect. | Acquired. | L. 99.8° F. R. 100.4° F. | One. | Perfect occlusion. | Seen four years after. Ring firm; no belt or pad worn. Seen two and a half years after; firmly ringed about his usual avocation without belt or support. After the first operation patient insisted that the other hernia should be operated on. |
| 12 | Nov. '82. | W. D. | 57 | " | 11 years. | " | " | " | " | " | " | |
| 13 | Mar. '82. | W. S. | 15 | Baker. | 15 months. | Intestinal. | Indirect. | Acquired. | 100.6° F. | None. | Two. | Wound superficial at end of fourteenth day; firm at end of twenty-first day, when dressed for second time. Seen three years after; ring firm, no pad worn. |

| | | | | | | | | | | | | | | |
|---|------------|---------|----|----------------|-----------|-------------------------|-----------|--------------|------------|------------------------|---------|-------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4 | June '82. | M. W. | 30 | Sailor. | 2 years. | Intestinal and omental. | Indirect. | Acquired. | Rad. cure. | 99.8° F. | None. | One. | Occlusion perfect. | Wound firm at end of fourteenth day. Seen at end of eighth month after operation; parts firm. No truss. Not since seen. |
| 5 | Sept. '82. | L. McD. | 45 | Laborer. | 3 years. | Intestine. | Indirect. | Acquired. | Rad. cure. | 102.4° F. | Slight. | Four. | Occlusion firm. | Suppuration ensued here—consequently ruptured dressings. Seen three years after; parts firm, no truss. |
| 6 | Mar. '83. | J. S. | 20 | School-master. | ? years. | Intestinal and omental. | Indirect. | Acquired. | Rad. cure. | 101° F. on two nights. | None. | One. | Occlusion perfect. | Seen one year after. Parts quite firm. No pad or bandage. |
| 7 | May '83. | M. L. | 25 | Laborer. | 3 months. | Intestine. | Indirect. | Acquired. | Rad. cure. | 100° F. | None. | One. | Occlusion perfect. | At end of twenty-first day dressings removed and wound found firm. Decalcified chicken bone drainage tubes separated. Two years after patient in good health; regularly at work. Parts firm. No truss. |
| 8 | Nov. '83. | S. S. | 10 | School-boy. | 8 years. | Intestine. | Indirect. | Con-genital. | Rad. cure. | 100.4° F. | None. | Two. | Occlusion perfect. | Wounds superficial at end of fourteen days; firm at end of twenty first. |
| | " | " | " | " | " | " | " | " | " | " | " | " | " | Three years after; Parts firm. No truss. |

CASES OF INGUINAL HERNIA SUBMITTED TO RADICAL CURE BY SPECIAL OPERATION. *Continued.*

| No. | Date. | Name. | Age. | Occupation. | NATURE OF HERNIA. | | | Operation. | Highest Rect. Temp. | Suppuration. | No. of dressings. | Result. | Remarks. |
|-----|------------|---------|------|-------------|-------------------|------------------|----------------------------------|-------------|---------------------|--------------|-------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | | Duration. | Contents of Sac. | Direct or Indirect. | | | | | | |
| | | | | | | | Congenital, Infantile, Acquired. | | | | | | |
| 20 | Jan. '84. | P. McA. | 15 | School-boy. | 5 years. | Intestine. | Indirect. | Acquired. | 102° F. once. | Few drops. | Two. | Occlusion perfect. | Two years after, parts firm. No truss. |
| 21 | May '84. | W. J. | 30 | Grocer. | 3 years. | Intestine. | Indirect. | Acquired. | 99° F. | None. | One. | Occlusion perfect. | When dressings removed at end of twenty-first day wound healed. Recalcined bone (Jamaican) absorbed. Eighteen months after parts firm. No belt, but wears a pad and bandage. |
| 22 | June '84. | M. McF. | 12 | School-boy. | 5 years. | Intestine. | Indirect. | Congenital. | 100° F. | None. | One. | Occlusion perfect. | Wounds seen at end of twenty-first day and found healed. One year after, parts firm. No truss. |
| 23 | June '84. | " | " | " | " | " | " | " | " | " | " | " | " |
| 24 | Sept. '84. | M. F. | 18 | Clerk. | 3 months. | Intestine. | Indirect. | Acquired. | 100° F. | None. | One. | Occlusion perfect. | Twenty-one days after wound seen, and found healed. Fifteen months after, parts firm. No truss. |

| | | | | | | | | | | | | | |
|--------------|---------|----|----------------|----------|-------------------------|-----------|------------|-----------------------------------------|-----------|-------|------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 25 June '85. | J. A. | 25 | Surgeon. | 7 years. | Omental. | Indirect. | Acquired. | Rad. cure. Removal of 1-4 lbs. omentum. | 100° F. | None. | One. | Occlusion perfect. | Dressings removed end of fourteen days. Wound firm ten months after, ring firm. No belt or pad. |
| 26 Aug. '85. | C. G. | 6 | Nil. | 2 years. | Intestinal. | Indirect. | Acquired. | Rad. cure. R. | 100.4° F. | None. | One. | Perfect occlusion. | Dressings removed at end of fourteen days. Wound firm. Five months after patient seen; both rings firm. Linear scars. No belt worn. |
| 27 Oct. '85. | C. G. | " | " | " | " | Indirect. | " | Rad. cure. L. | 100° F. | " | " | " | " |
| 28 Oct. '85. | J. McC. | 25 | Builder-maker. | 3 years. | Intestinal. | Indirect. | Acquired. | Rad. cure. | | None. | One. | Occlusion perfect. | Ring firm at end of six months. Not since seen. |
| 29 Oct. '85. | J. S. | 23 | Nil. | 5 years. | Intestinal and omental. | Indirect. | Acquired. | Rad. cure. | 98.8° F. | None. | One. | Occlusion perfect. | Twenty-one days after, wound firm—healed. Eighteen months after parts firm. No truss. |
| 30 Oct. '85. | J. W. | 9 | School-boy. | 7 years. | Intestinal. | Indirect. | Infantile. | Rad. cure. | 100° F. | None. | One. | Occlusion perfect. | Examined wound at end of twenty-one days. Decalcified chicken bone drainage tube disappeared. Wound firm. Superficial stitches separated. Six months after parts firm. No truss. |

CASES OF INGUINAL HERNIA SUBMITTED TO RADICAL CURE BY SPECIAL OPERATION. *Continued.*

| No. | Date. | Name. | Age. | Occupation. | NATURE OF HERNIA. | | | Operation. | Highest Rect. Temp. | Support- tion, dressings. | Result. | Remarks. |
|-----|-----------|-------|------|-------------|-------------------|------------------------------|-----------------------|----------------------------------|--------------------------|------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | | Duration. | Contents Direct or Indirect. | Content of Sac. | | | | | |
| 31 | Jan. '86. | W. P. | 22 | Sailor. | 9 months. | Intestinal. | Indirect. Acquired. | Rad. cure. | 100° F. on one occasion. | None. | Occlusion perfect. | Twenty-one days after wound found firmly united. Decalcified chicken bone drainage tube absorbed, all but minute portions which projected from wound, which were found separated and lying in dressing. Superficial stitches also separated. Linear scar. Four months after parts firm. No truss. |
| 2 | Feb. '86. | J. C. | 13 | School-boy. | 12 years. | Intestinal. | Indirect. Congenital. | Rad. Cure for Congenital hernia. | 100° F. | None. | Occlusion perfect. | Twenty-one days after wound found firm. Decalcified chicken bone drainage tube absorbed. Linear scar. |
| 3 | Mar. '86. | C. C. | 5 | Nil. | 3 years. | Intestinal. | Indirect. Congenital. | Rad. cure. | 102.4 F. | Slight. | Three. | Urine saturated dressings, temperature increased and slight suppuration in consequence dressings more frequent. |

TABLE NO. 2.

CASES OF STRANGULATED INGUINAL HERNIA IN WHICH RADICAL CURE (SPECIAL OPERATION) WAS PERFORMED SUBSEQUENT TO RELIEF OF STRANGULATION.

| No. | Date. | Name and Age. | Occupation. | NATURE OF HERNIA. | | | | OPERATION. | | COURSE AFTER OPERATION. | | Result. | |
|-----|-----------|-----------------|-------------|---------------------|------------------|-------------------------|----------------------------------|--------------------|----------------------------------------------|-------------------------|--------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | Duration of hernia. | Contents of Sac. | Direct or indirect. | Congenital, infantile, acquired. | For strangulation. | For Rad. Cure. | Highest Rect. Temp. | Suppuration, No. of dressings. | | |
| | | | | | | | | | | | | | |
| 1 | Mar. '80. | J. McL. 20 yrs. | Laborer. | 7 years. | 24 hours. | Omental and intestinal. | Indirect. | Acquired. | Removal of a Rad. cure by special operation. | 101° F. all night. | None. | Two. | Occlusion perfect. Seen two years after found firm occlusion. No belt worn. |
| 2 | Aug. '80. | J. B. 19 yrs. | Laborer. | 2 years. | 96 hours. | Intestinal. | Indirect. | Acquired. | Relief of stricture. Reduction of hernia. | 99° F. | None. | One. | Occlusion firm—at end of eighth month still solid. No truss; not since seen. |
| 3 | Dec. '80. | J. G. 53 yrs. | Coachman. | 8 years. | 12 hours. | Intestinal. | Direct. | Acquired. | Relief of stricture; reduction of hernia. | 100 F. | None. | Four. | This man rose from bed on fourteenth day, lifted a heavy basket of clothes and had return of hernia. It was again operated on, and he left |

CASES OF STRANGULATED INGUINAL HERNIA IN WHICH RADICAL CURE (SPECIAL OPERATION) WAS PERFORMED SUBSEQUENT TO RELIEF OF STRANGULATION.—Continued.

| No. | Date. | Name and Occupation. | NATURE OF HERNIA. | | OPERATION. | | COURSE AFTER OPERATION. | | | Result. | | | |
|-----|-----------|-------------------------|-------------------------|-----------------------------------------|-------------------------------|----------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------|----------|--------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | Duration. Of hernia. | Contents of sac. Direct or indirect. | Contents of sac. Indirect. | Congenital, infantile, acquired. | For strangulation. | For Rad. Cure. | Highest Rect. Temp. | | Suppuration. | No. of dressings. | |
| 8 | July '83. | P. B. 23 yrs. Drover. | 5 years. | 31 hours. | Intestinal. | Indirect. | Acquired. | Relief of double stricture, one fibrous band around intestine, reduction of hernia. | Relief of stricture, reduction of hernia. | 99.4° F. | None. | Two. | Occlusion firm. Two years after found at work. No truss. |
| 9 | Dec. '84 | B. T. 17 yrs. Clerk. | (?) years. | 37 hours. | Intestinal. | Indirect. | Infantile. | Relief of stricture, reduction of hernia. | Relief of stricture, reduction of hernia. | 101° F. | Slight. | Three. | This patient had pneumonia at time of admission into ward, and prior to operation. Recovery; occlusion perfect. One year after quite well. Firm walls; no truss. |
| 10 | Dec. '84. | C. K. 28 yrs. Engineer. | 7 years. | 36 hours. | Intestinal. | Indirect. | Acquired. | Relief of double stricture, one at ring, the other by fibrous band at neck of sac. Reduction of hernia. | Relief of stricture, reduction of hernia. | 99.2° F. | None. | Two. | Occlusion perfect. Firm walls. Seen eighteen months after. Regularly at work, occlusion firm; wears bandage. |

| | | | | | | | | | | | | | | |
|---|-----------|-------------------|----------|----------|-----------|-------------|-----------|------------|--------------------------------------------------------------------------------------------------------|------------|-----------|-------|------|---------------------------------------------------------------------------------------------------------------------------------|
| 1 | Mar. '84. | J. J. 4 mos. | Nil. | 2 days. | 24 hours. | Intestinal. | Indirect. | Infantile. | Relief of stricture, reduction of hernia. Valved tube on skin to prevent urine passing into wound. | Rad. cure. | 99° F. | None. | One. | Taxis failed, child in agony—under chloroform taxis again failed. Two years after child in good health. No firm ring. No truss. |
| 2 | May '84. | J. McA. 30 years. | Laborer. | 4 years. | 12 hours. | Intestinal. | Indirect. | Acquired. | Stricture relieved by means of dressing foriceps and probe pointed histoury. Reduction of hernia. | Rad. cure. | 100.4° F. | None. | One. | Firm occlusion. One month after founding firm. Regularly at work. No truss. |
| 3 | June '84. | D. D. 50 yrs. | Carter. | 7 years. | 72 hours. | Intestinal. | Indirect. | Acquired. | Stricture relieved. Reduction of hernia. | Rad. cure. | 100.4° F. | None. | One. | Firm occlusion. 18 months after founding firm. No truss. Regularly at work. |
| 4 | Feb. '85. | J. McC. 9 months. | Nil. | 3 days. | 72 hours. | Intestinal. | Indirect. | Acquired. | Valved incision on skin to prevent urine passing into wound. Relief of stricture. Reduction of hernia. | Rad. cure. | 98.6° F. | None. | One. | Taxis failed under chloroform. Seen one year after. Ring quite firm. No truss. |

TABLE NO. 3.

CASES OF STRANGULATED FEMORAL HERNIA IN WHICH RADICAL CURE (SPECIAL OPERATION) WAS PERFORMED SUBSEQUENT TO RELIEF OF STRANGULATION.

| NATURE OF HERNIA. | | | OPERATION. | | | COURSE AFTER OPERATION. | | | Result. |
|------------------------|-----------|-----|------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------|--------------|-------------------|------------------------------------------------------------------------------|
| Name and Occupation. | Date. | No. | Duration. — Of hernia. | Contents For strangulation. | For Rad. Cure. | Highest rect. temp. | Suppuration. | No. of dressings. | |
| Mrs. S. 34. Housewife. | July '78. | 1 | (?) years. 36 hours. | Intestine and omentum. Removal of a couple of inches of omentum. Relief of stricture, reduction of bowel. | Sac formed into pad and placed abdominal aspect. Falciiform process united to Gimbernat's ligament. | 99.8° F. | None. | One. | Ring firm. At end of eighth month parts firmly occluded. No truss. |
| Mrs. T. 50. Housewife. | Feb. '81. | 2 | | Intestine and omentum. Relieved stricture. Reduction of hernia. | Sac formed into pad and placed abdominal aspect. Falciiform process united to Gimbernat's ligament. | 100° F. | Slight. | Two. | Ring firm. Seen one year afterwards, parts firm; no truss or pad. |
| Mrs. M. 23. Housewife. | May '81. | 3 | 7 years. 50 hours. | Intestine and omentum. Removed 5x4 in. of omentum. Relieved stricture and reduced hernia. | Sac formed into pad and placed abdominal aspect. Falciiform process united to Gimbernat's ligament. | 99.8° F. | None. | One. | Occlusion perfect. Seen and examined three years after; parts firm—no truss. |
| Mrs. L. 56. Housewife. | July '81. | 4 | 6 years. 28 hours. | Intestine and omentum. Omentum removed. Relief of stricture, reduction of bowel. | Sac formed into pad and placed abdominal aspect. | 98.4° F. | None. | One. | Ring firm; not seen after dismissed. |

CASES OF STRANGULATED FEMORAL HERNIA IN WHICH RADICAL CURE (SPECIAL OPERATION) WAS PERFORMED SUBSEQUENT TO RELIEF OF STRANGULATION.

| No. | Date. | Name and Occupation. | NATURE OF HERNIA. | | OPERATION. | | COURSE AFTER OPERATION. | | | Result. |
|-----|-----------|------------------------|-------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------|--------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | Duration. | Contents of Sac. | For strangulation. | For Rad. Cure. | Highest Rect. Temp. | Suppuration. | No. of dressings. | |
| 9 | July '85. | Mrs. N. 53, Housewife. | 12 years. | Intestine and omentum. | Bowel adherent to sac and separated from sac with great difficulty. Portion of omentum which was gangrenous was removed. | Sac formed into pad and placed abdominal aspect. Fractiform process united to Gimbernat's ligament. | 103° F. | Suppuration. | Four. | Suppuration at first two dressings considerable—little at end of third, 21 days after. At end of 4th week wound firm. Seen nine months after. Parts firm. No truss. |